IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants:	Samuel M. Babb et al.	Confirmation No.: 6460
Application Serial No.:	10/650,028	
Filed:	August 27, 2003	
Title:	SYSTEM, METHOD, AND COMPUTER-READABLE MEDIUM FOR REDUCTION OF COMMUTATION-RELATED ACOUSTIC NOISE IN A FAN SYSTEM	
Group Art Unit:	2837	
Examiner:	Duda, Rina, I.	
Docket No.:	200309579-1	

DECLARATION OF JEFFREY S. WEAVER
UNDER 37 C.F.R. SECTION 1.131

Mail Stop: Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

I, Jeffrey S. Weaver, a co-inventor of the above-referenced patent application, enclose hereto as Exhibit A, a true copy of an invention disclosure form, with dates and portions redacted as noted, which was received by the Legal-Intellectual Property department of Hewlett-Packard Company on a date prior to April 30, 2003, in the ordinary course of business as part of Hewlett-Packard Company's invention disclosure program, and which indicates a conception of the invention which is the subject of the above-referenced patent application on a date(s) prior to April 30, 2003. In accordance with Hewlett-Packard Company's invention disclosure program at that time, upon receipt of an invention disclosure document from an inventor, the invention disclosure document is dated with the date of receipt by the Legal Intellectual Property department of Hewlett-Packard Company and assigned a docket number.

CERTIFICATE OF MAILING/TRANSMISSION (37 C.F.R. §1.8(A))

MAILING

☒ I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to:

MAIL STOP: AMENDMENT
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

FACSIMILE

☐ I hereby certify that this paper is being transmitted to the Patent and Trademark Office facsimile number (703) 872-9306 on:

Date: July 14, 2006

Signature: Cindy C. Dioso

Cindy C. Dioso

DOCKET NO.: 200309579-1 PATENT

The invention that is the subject matter of the above-referenced application was conceived while working in the United States for, and an employee of, Hewlett-Packard Company. The invention disclosure form attached hereto as Exhibit A includes an explanation of the subject matter of the claims of the present application. Specifically, at least page 3 of the invention disclosure form includes an explanation of the subject matter of the claims of the present application.

I also enclose hereto as Exhibit B true copies of sample correspondence, with portions redacted as noted, with counsel pertaining to the preparation of the above-referenced patent application which was received on a date after April 30, 2003, and which indicates, alone and/or in combination with the invention disclosure form, diligence in the completion of the invention which is the subject of the present Application from a time prior to April 30, 2003, continuously up to the date of filing of the above-referenced patent application.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

SIGNATURE

Jeffrey S. Weaver

Signature _____ Date: 7-14-2006

Citizenship: United States

Residence: Fort Collins, CO

EXHIBIT A

Write in Dark Ink on Front Side Only, Please

INVENTION DISCLOSURE REDACT PAGE ONE OF 3

PDNO 200309579 DATE RCVD ATTORNEY CMH

Instructions: The information contained in this document is HP Confidential and may not be disclosed to others without prior authorization. Submit this disclosure to the HP Legal Department as soon as possible. No patent protection is possible until a patent application is authorized, prepared, and submitted to the Government.

Descriptive Title of Invention:

Fan Noise Reduction via Drive Modulation

Name of Project:

n/a

Product Name or Number:

Rockwood

Was a description of the invention published, or are you planning to publish? If so, the date(s) and publication(s):

Redact

Was a product or prototype including the invention (i) announced, offered for sale, or sold to any third party (for example, customer, supplier, contract manufacturer), or (ii) sold to HP by, for example, a supplier or contract manufacturer, or (iii) is such activity proposed? If so, when and to whom?:

Redact

Was the invention disclosed to anyone outside of HP, or will such disclosure occur? If so, the date(s) and name(s):

Redact

If any of the above situations will occur within 3 months, call your IP attorney or the Legal Department now at 1-858-4919 or 970-898-4919.

Was the invention described in a lab book or other record? If so, please identify (lab book #, etc.)

Redact

Was the invention built or tested? If so, the date:

Redact

Was this invention made under a government contract? If so, the agency and contract number:

Redact

Description of Invention: *Please preserve all records of the invention and attach additional pages for the following. Each additional page should be signed and dated by the inventor(s) and witness(es).*

A. Description of the construction and operation of the invention (include appropriate schematic, block, & timing diagrams; drawings; samples; graphs; flowcharts; computer listings; test results; etc.)
B. Advantages of the invention over what has been done before.
C. Problems solved by the invention.
D. Prior solutions and their disadvantages (if available, attach copies of product literature, technical articles, patents, etc.).

Signature of Inventor(s): Pursuant to my (our) employment agreement, I (we) submit this disclosure on this date: Redact

Employee No.	Name	Signature	Telnet	Mailstop	Entity & Lab
Redact	Samuel M. Babb		Redact	Redact	PSG / WGBU
Redact	Jeffrey S. Weaver		Redact	Redact	PSG/WGBU

(If more than four inventors, include additional information on another copy of this form and attach to this document)

Redact

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INVENTION DISCLOSURE HP Confidential PAGE 2 OF 3

Signature of Witness(es): *(Please try to obtain the signature of the person(s) to whom invention was first disclosed.)*

The invention was first explained to, and understood by me (us) on this date: Redact

Full Name	Signature	Date of Signature
Kelly J. Brent		Redact
Stacie F. Mathis	Stacie F. Mathis	Redact

Inventor & Home Address Information: *(If more than four inventors, include addl. information on a copy of this form & attach to this document)*

Inventor's Full Name: Samuel M. Babb
Street: Redact
City: Redact | State: Redact | Zip: Redact
Do you have a Residential P.O. Address? P.O. BOX: Redact | City | State | Zip
Greated as *(nickname, middle name, etc.)*: Redact | Citizenship: Redact

Inventor's Full Name: Jeffrey Scott Weaver
Street: Redact
City: Redact | State: Redact | Zip: Redact
Do you have a Residential P.O. Address? P.O. BOX: Redact | City | State | Zip
Greated as *(nickname, middle name, etc.)*: Redact | Citizenship: Redact

Inventor's Full Name:
Street:
City | State | Zip
Do you have a Residential P.O. Address? P.O. BOX | City | State | Zip
Greated as *(nickname, middle name, etc.)* | Citizenship

Inventor's Full Name:
Street:
City | State | Zip
Do you have a Residential P.O. Address? P.O. BOX | City | State | Zip
Greated as *(nickname, middle name, etc.)* | Citizenship

Redact

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Description of Invention: *Please preserve all records of the invention and attach additional pages for the following. Each additional page should be signed and dated by the inventor(s) and witness(es).*

A. Description of the construction and operation of the invention (include appropriate schematic, block, & timing diagrams; drawings; samples; graphs; flowcharts; computer listings; test results; etc.)

Electrically powered fans especially those types used in computer and electronic equipment produce acoustic noise that people find objectionable. One type of prominent acoustic noise is generated by commutation events causing torque modulation of the rotor with an impulse-like profile. Periodic commutation events are continuously generated as long as the fan motor is being driven. This kind of noise is characterized by a buzzing sound. It is most noticeable at lower RPM, but is present at all times the motor is driven. It is present in most common low-cost fans used in electronic equipment due to the low-cost drive schemes used to commutate the fans.

This invention detects the commutation event using any common, well-known-in-the-art method. Thus, a periodic signal is generated which represents the commutation frequency and the phase, or timing of the commutation events. Using a phase locked loop (which is also well known in the art), or the equivalent, the timing of the commutation event is predicted and the drive to the fan motor modulated to reduce the impulse in the generated torque modulation. This may be accomplished by many means, but the easiest is to simply reduce the drive to the motor during the commutation event. This drive reduction may take the form of smoothly adjusting the voltage supplied to the motor, or smoothly adjusting the duty cycle of a pulse width modulated drive, or many other obvious forms.

B. Advantages of the invention over what has been done before.

Significantly reduces generated noise, especially at low fan speeds with very little cost increase.
Method can be applied to existing low-cost fans.

C. Problems solved by the invention.

Increases customer satisfaction and reduces annoyance.

D. Prior solutions and their disadvantages (if available, attach copies of product literature, technical articles, patents, etc.).

More expensive and sophisticated fan drives exist, but are relatively expensive.

Inventor: _____ date: Redact Inventor: _____ Date: _____

Inventor: _____ date: Redact Inventor: _____ Date: _____

Witness: _____ date: Redact Witness: _____ Date: Redact

Redact

EXHIBIT B

From: McDonald, Steven
Sent: Tuesday, May 20, 2003 3:54 PM
To: 'sam.babb@hp.com'
Cc: 'jweaver@hp.com'
Subject: 200309578; 200309579

Sam,
The commutation disclosure is the '579 listed above. If you have any additional documents/schematics for the '578, please forward them as well.
-Steve

Steven T. McDonald
Munsch Hardt Kopf & Harr, P.C.
1445 Ross Avenue, Suite 4000
Dallas, Texas 75202-2790
Direct Dial: 214.880.7667
Direct Fax: 214.978.5309
Email: smcdonald@munsch.com
http://www.munsch.com

From: WEAVER,JEFF (HP-FtCollins,ex1) [jweaver@hp.com]
Sent: Thursday, June 05, 2003 1:13 PM
To: McDonald, Steven
Subject: RE: 200309579
Importance: High

Steve,

Here is the diagram we discussed. Let me know what questions you have. I am at your disposal.

Jeff

Jeffrey S. Weaver
Hewlett-Packard Company
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From: McDonald, Steven
Sent: Thursday, July 17, 2003 6:26 PM
To: 'jweaver@hp.com'

Jeff,
Attached is a rough draft for your review. Redact
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Redact
Redact
Redact

-Steve


drawings.pdf


200309579-1-draft.doc

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August 20, 2003

VIA COURIER

Mr. Jeffrey S. Weaver
Redact
Redact
Redact

Re: U.S. Patent Application
Entitled: *System, Method, and Computer-Readable Medium for Reduction of Commutation-Related Acoustic Noise in a Fan System*
Your Ref. No.: 200309579-1
Our File No.: 5804.267-1

Dear Jeff:

Enclosed are the Declaration and Power of Attorney for the Patent Application and Assignment of Patent Application documents. Please do not execute these documents until the application meets with yours and your co-inventors' approval. When the application is satisfactory, please sign the documents **(in blue ink)**, exactly as it is typewritten and date each document. **Please note that the Assignment document should be dated twice.** After the documents are executed, please return all documents to me as soon as possible in the enclosed, self-addressed Federal Express envelope so that we may file same with the USPTO.

Should you have any questions or comments concerning this matter, please do not hesitate to contact me.

Regards,

Steven T. McDonald

STM:vrc
Enclosures

Redact